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Solid State Code Matrix Reader

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has completed the design, development, and test of a fully automatic, high speed reconnaissance film reader capable of reading MIL-STD-782B code matrix data. The new system provides for the first time a completely solid state system capable of rapidly decoding information contained in aerial reconnaissance films.

The code matrix reader system was developed under a Navy contract for the Photographic Division of the Naval Air Systems Command. As a natural outgrowth of this development, two production design models of the system are currently being fabricated under an Air Force contract for delivery in June, 1967.

Operation

Basically, the reader uses a single line of photo sensitive diodes to detect film images. Employed with the ADAS-annotated film, the code blocks are read and the diode outputs (analog) are converted to digital form and stored in a memory. Sensing circuitry, associated with the reader head, detects when a code block is being read, allowing sufficient time for the total code block to enter a memory section. This memory is then scanned and the digital code block representation is identified as "dots" with each dot assigned to a proper location in a buffer memory utilizing the standard code block format.

Performance Specifications

The code matrix reader system features the following capabilities

- Reading of MIL-STD-782B Code Blocks for any code block orientation and direction of travel for both positive and negative films
- Provides parity check and indication
- Reads at speeds up to 40 inches per second (maximum of 8 code blocks per second)
- Theoretical error rate of 1/500,000 bits
- Demonstrated average long term error rate of 1/40,000 bits (completely independent of film speed)
- MTBF (mean-time-between-failure) of 2000 hours minimum
- Built in test equipment providing self test capability
- MTTR (mean-time-to-repair) of 30 minutes maximum

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Performance Specifications (Continued)

- "Availability" of 99.95 percent (ratio of on-time to unscheduled off-time)
- Complete Mil spec system with useful life of 8 years minimum
- Output compatible with magnetic tape unit, high speed printer, numeric displays, and general purpose computers
- Modular design compatible with switching module for time sharing of logic drawers
- "Search and Retrieval" modes of operation are adaptable for reader operation independent of other systems, such as computers

Physical Description

The code matrix reader system is comprised of the following:

Read Head (12" x 4" x 13")	Contains film gate and guide rollers / diode array / light source / optics assembly / 10" traversing mechanism (across films)
Input Sensor Drawer (22" x 19" x 10")	Contains detection circuits / detection power supplies
Logic Drawer (22" x 19" x 14")	Contains main memory / buffer memory / timing and control circuits / recognition and processing logic / computer interface logic

The drawers of the electronic system may be mounted in standard 19 inch racks or in a separate cabinet (measuring 22 inches long, 19 inches wide and 30 inches high) providing flexibility in equipment location. The electronics cabinet is connected to the solid state sensor head by a flexible cable up to eight feet in length.

The total system requires 600 watts of power at 400 Hertz, single phase, from a 120 volt source.

Weight of the code matrix reader system is less than 190 pounds.

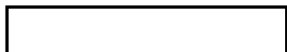
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MAS-1

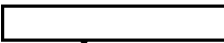

Micrologic Annotation Systems

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 has advanced the "State of the annotation art" with the introduction of a micro-miniature version of its "AN" series of annotation systems.

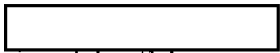
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Currently the Nation's largest supplier of this type of equipment, 
 has designed, developed and manufactured auxiliary data annotation systems since the mid 1950's.

The current models of solid state systems, the AN/ASQ-90, AN/ASQ-92, AN/ASQ-94 are in service in a multitude of current high performance aircraft including the RF-101, RF4 B/C, KC-135 (AN/USQ-28) and others.

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The proven compatibility of the  annotation systems with a wide variety of sensors has been retained in this new system. The sensors can now be annotated in the following 3 types of format:

1. Full compliance with MIL-STD-782B
2. Alpha numeric annotation for "quick look" assessment of the data.
3. Alternating 1 and 2 above to retain the full information of the MIL-STD-782B data block, while allowing "quick look" capability.

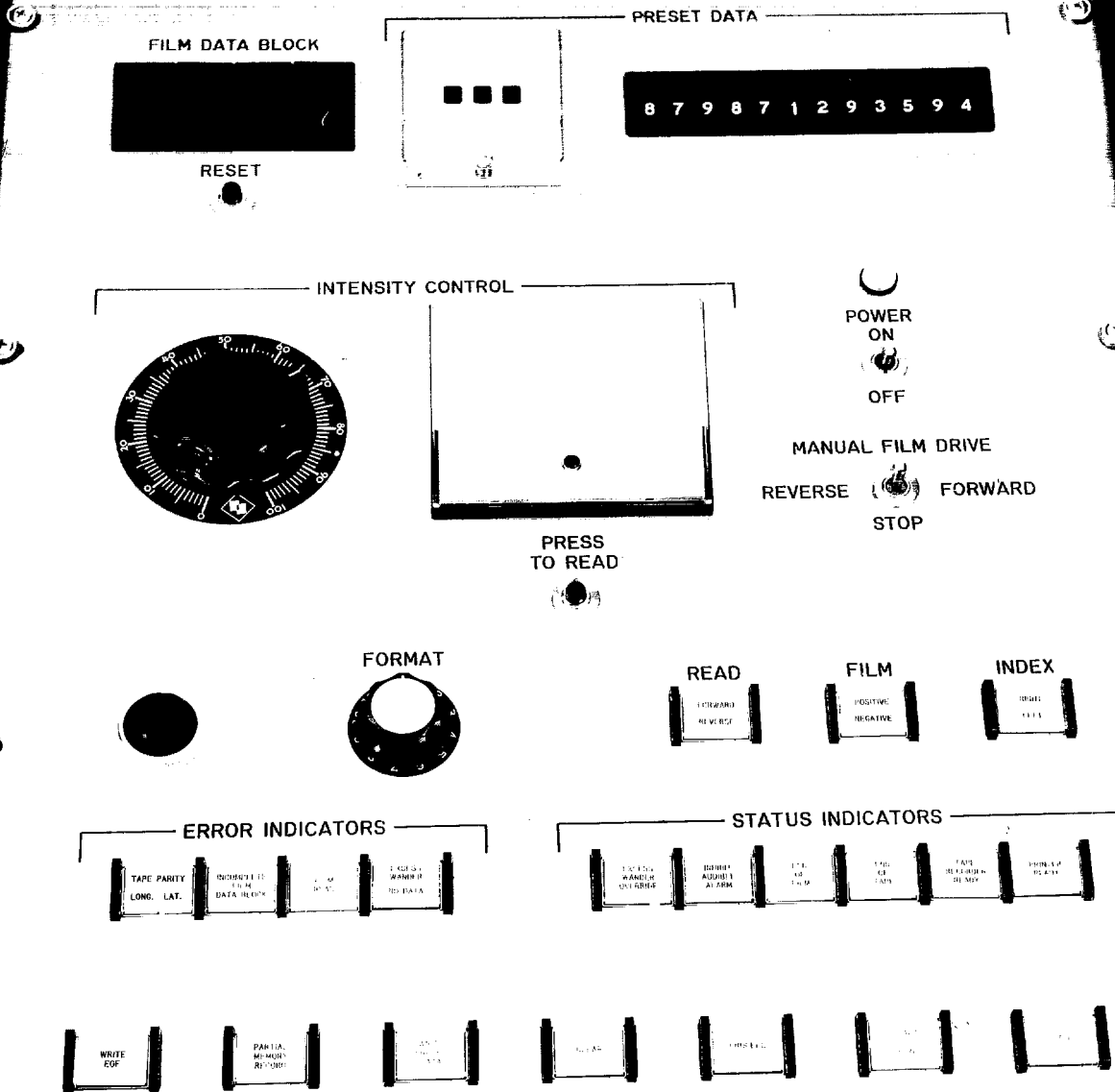
Each sensor can be individually programmed to receive type 1, type 2 or type 3 formats.

Provision has been made for the interfacing of this unit with various aircraft through the use of solid state analog to digital and servo to digital converters as well as directly interfacing with digital computers.

The MAS-1 currently in production for the RF-104G accepts 65 digital inputs and one DC Voltage for altitude. In this configuration the MAS-1 has the following characteristics:

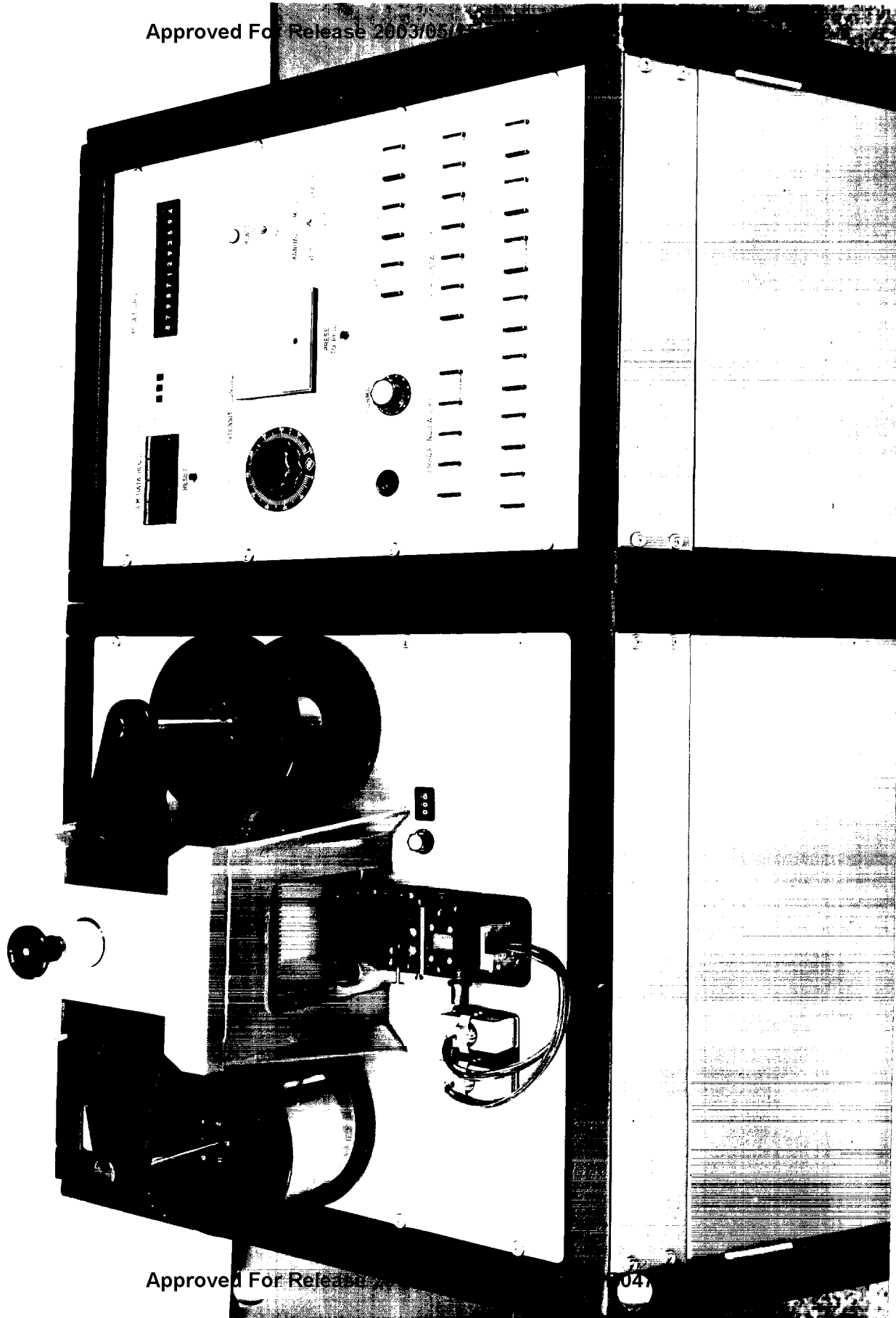
- Size - 6" x 7" x 12"
- Weight - 18 pounds
- Power - 140 watts in accordance with MIL-STD-704
- Annotation - in accordance with MIL-STD-782B
- RFI - in accordance with MIL-I-26600
- Environment - in accordance with MIL-E-5400

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Approved For Release 2003/05/15 : CIA-RDP78B04747A001600010088-8

Approved For Release 2003/05/14



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